

Comprehensive and Strategic Plans for Public Transportation

Briefing Paper: Service Quality

Transit service quality is a broad topic that comprises how well a transit agency meets its customers' travel needs. Key measures of service quality include whether service is fast and reliable, whether it comes frequently throughout the day, and whether there are adequate seats or places to stand on buses when they arrive. Service quality suffers when buses are delayed or when ridership exceeds capacity. Maintaining and improving service quality is critical to achieving Metro's objectives to make public transit a more attractive and competitive mobility option. This issue has become more critical recently, as increasing ridership and congestion have affected crowding, travel speed and on-time performance.

This paper examines the challenges Metro Transit faces to maintain and improve its service quality, and tools and strategies that can be effective. Recommendations include strengthening Metro's commitment to providing reliable schedules, monitoring and responding to changes in service quality, concentrating transit service onto reliable pathways in urban centers, expanding use of speed and reliability improvements, managing HOV lane performance, and demonstrating innovative service delivery techniques that can improve service quality.

Industry Definition of Service Quality

The transit industry definition of service quality is found in the Transit Capacity and Quality of Service (TCQOS) Manual¹, which defines service quality as "the overall measured or perceived performance of transit service from the passenger's point of view." It stresses that measures of transit performance must include not only measures of capacity, but also other measures of service quality that reflect the passenger's perception of service performance.

The TCQOS manual includes two types of service quality measures: those related to availability of service and those related to comfort and convenience. Measures included in the TCQOS manual for both availability and comfort/conveniences are shown in below.

TCQOS Manual - Service Quality Measures

	Transit Stop	Route Segment	System
Availability	▪ Frequency	▪ Hours of Service	▪ Service Coverage
Comfort & Convenience	▪ Passenger Load	▪ Reliability	▪ Transit vs. Auto Travel Time

¹ Transit Cooperative Research Program (TCRP), Report 100: Transit Capacity and Quality of Service Manual, 2nd Edition, 2003.

This paper will focus primarily on the measures associated with comfort and convenience; however, the measurement of both service quality and comfort/convenience will be addressed further in the upcoming briefing paper on monitoring and management, due for the May RTC meeting.

Measures of comfort and convenience

- **Passenger Load** addresses whether there is room for each passenger on a bus once it arrives. Metro considers a bus to be overloaded if passengers are turned away, or if passengers must regularly stand for 20 minutes or longer. Of course, passengers may have different expectations. Overloaded buses can occur when ridership exceeds capacity, when incidents and special events cause ridership surges, or when a bus is late and therefore carries additional riders who would otherwise have taken the following bus.
- **Reliability** addresses whether a bus arrives when it is supposed to. On most routes, reliability refers to whether or not a bus departs on schedule. Metro considers service to be reliable if it arrives no more than one minute early, and no more than five minutes late. On very high frequency routes, some riders will be less concerned about whether a bus arrives on schedule, and more concerned with whether buses come by at regular intervals (headways). Reliability is impacted by many factors that will be discussed at length below.
- **Transit vs. Auto Travel Time** addresses how fast buses travel compared to an automobile making the same trip. In most cases transit is slower than driving for a host of reasons. In some cases transit may be faster – generally this happens when buses don't make as many stops and have signal or lane priority over other vehicles on the street. Metro does not have a standard for transit vs. auto travel time, but we have a formal objective to reduce average HOV travel time relative to SOV travel.

Metro's Service Quality Performance and Challenges

Metro service developed in three distinct waves, and the services developed during each wave present different and unique service quality challenges.

- **Old routes designed for a different era:** The oldest parts of the system were inherited from the former Seattle Transit, which comprised most of the region's transit service prior to Metro's formation by voters in 1972. Many of these routes were designed decades ago, presenting some unique service quality challenges. Seattle has the slowest services overall.
- **Freeway express services:** When Metro was formed in the 1970's, it expanded bus service to the rest of King County, much of it as express bus service focused on downtown Seattle and Seattle's University District. Development of HOV lanes, park-and-ride lots and the downtown Seattle transit tunnel have allowed faster and more reliable services that have made these routes successful, and garnered national acclaim. More recently, deteriorating performance of HOV lanes has significantly eroded transit performance on many of these routes. Extreme variability in traffic makes scheduling these routes difficult.

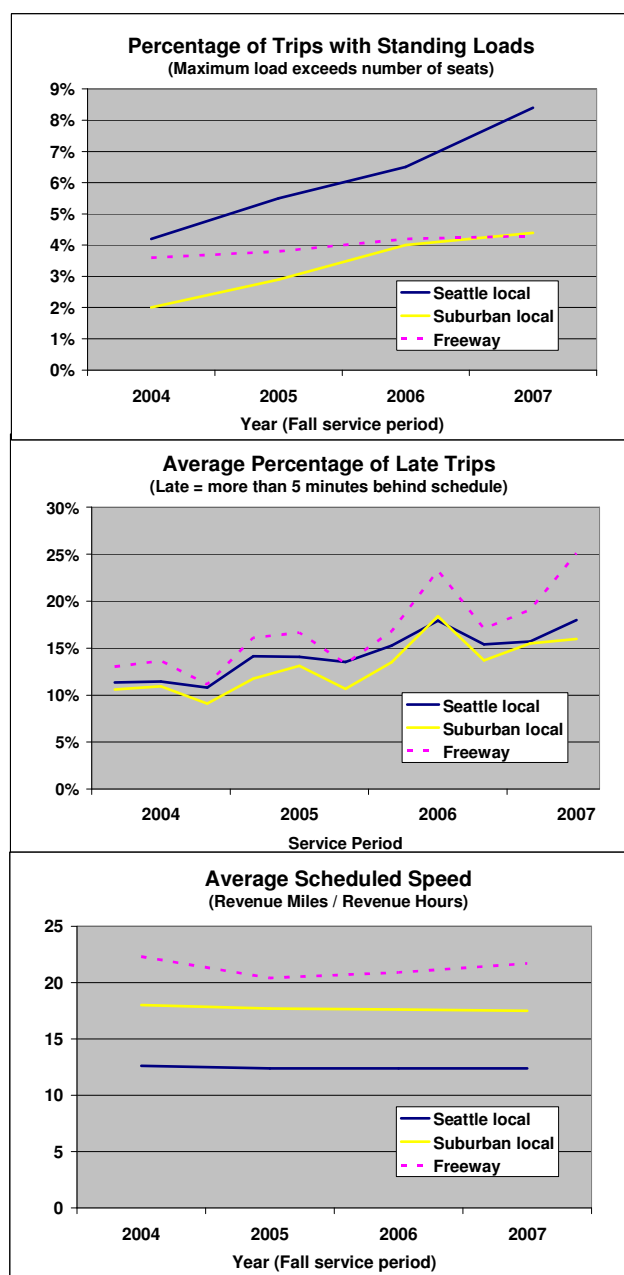
- **New local service:** Since the 1990's, Metro's emphasis has been on expanding all-day local service, especially in the suburbs. Service quality issues on these newer routes are not compounded by outdated route design. In general, schedules are better matched to traffic conditions, and stops are spaced more appropriately. But as traffic conditions deteriorate, these routes also require schedule adjustments and service management to compensate.

Downtown Seattle presents a special set of service quality issues. With about 60% of all Metro bus trips passing through downtown Seattle, changes in traffic conditions there can have a big impact on the service quality overall. In addition, the transit tunnel provides a unique opportunity for higher service quality because it is a transit-dedicated right of way.

Service quality snapshot and comparisons

The graphs at the right show some commonly-used measures of service quality, comparing recent experience in loading, on-time performance and speed for Seattle local routes, suburban local routes and freeway routes. Routes were grouped into those categories based on where the majority of their route-miles are located.

- **Loading:** The first chart shows the percentage of trips where the passenger load exceeded the number of seats between 2004 and 2007. As ridership has increased without a commensurate increase in service, the incidence of overloaded buses has increased.
- **On-time performance:** The second chart shows the average percentage of late trips on routes in each category, where late is defined as being more than five minutes behind schedule. Local and express services have both seen an increase in late trips. Freeway routes have the worst on-time performance overall, having both early and late trips.
- **Speed:** The third chart shows schedule speeds in average miles per hour. Seattle speeds are lower than for either local suburban or freeway services.



Service quality challenges for older routes with outdated design

Many Seattle routes would require expensive structural changes to fully address service quality issues. Having been designed more than half a century ago, many of these routes are too long resulting in unreliable travel times. With travel speeds slowing and travel times increasing at the historical rate of 1% per year, Seattle's local service quality has deteriorated despite Metro's continued efforts to manage and improve service. Using the terms from the TCQOS Manual, Seattle bus riders enjoy the highest measures of availability of service compared to the rest of the county, but they endure the lowest measures of comfort and convenience.

Through-routing

Many of Seattle's routes are very long, making it hard to provide reliable service. In many cases, these long routes are due to the practice of "through-routing," where two routes are spliced together downtown. A through-routed bus enters the downtown from one route and continues out the other end of downtown as a different route. Through-routing is a very efficient practice, because the bus can combine the function of dropping off passengers from the first route while picking up riders for the next route downtown, so through-routed routes require fewer service hours to operate and fewer bus parking spaces downtown.

These routes were not too long when they were first designed, but as travel times have increased over several decades, many have become too long to manage effectively. Of the 25 routes that showed the lowest ratings for on-time performance in 2007, 17 were part of a through-route connection through downtown Seattle.

Disconnecting through-routes (or more generally, breaking any long route into two shorter ones) is an expensive proposition – for the same reason that made through-routing efficient originally. Breaking through-routes requires that each route pass through town separately, adding operating expense. Additional time is also needed at the route's new downtown terminals to give the driver a break and a chance to get back on schedule if the previous trip was delayed.

On top of this, breaking through-routes adds to the number of bus trips passing through downtown, and increases the number of bus parking places needed downtown. Finding parking spaces for buses waiting to make their next trip (or "laying over") is one of the biggest challenges to expanding transit. For these reasons, breaking through-routes is only considered rarely – but in some cases this may be the only way to achieve reliable service.

Stop spacing

Similarly to through-routes, bus stop locations were chosen on many routes decades ago, when bus speeds were higher than today. Especially in Seattle, the spacing between bus stops is very close on some routes, and is a major factor in the slowing of bus travel speeds. Metro studies show that 20 seconds can be used just for accelerating and decelerating at each stop, aside from the time it takes to load and unload passengers. As traffic worsens, buses have more trouble finding gaps in traffic so they can reenter the traffic stream after stopping.

Industry research has shown that reducing the number of stops from 6 per mile to 2 (as proposed for RapidRide routes) cuts travel time by 50%. Metro has consolidated bus stops along some corridors, improving speed, reliability and ridership. Consolidation of stops is not always popular with riders who may need to walk further to reach a bus stop, but it benefits others by reducing travel times and travel time variability, increasing ridership as a result.

Traffic conditions and traffic calming measures

Seattle has advantages over its neighbor cities, having been developed with a dense street grid and sidewalks in many parts of the city. Population growth and additional development in Seattle has increased traffic congestion; but Seattle neighborhoods have not seen the rapid growth that many suburban areas have encountered in the last few decades.

However, some of Seattle's efforts to calm traffic and improve the pedestrian environment have had unintended negative impacts on transit speeds. Streets that once had four lanes have been narrowed to three, with the center lane devoted to turn movements. In a four-lane configuration, buses could stop in-lane in the outside of two lanes, allowing traffic to pass in the second lane. In a three-lane configuration with on-street parking, buses must leave the traffic stream to stop, and bus drivers must wait for a gap in the traffic to continue on their way. Even though state law requires traffic to yield to buses, safe drivers wait to make sure that space will be available.

Overloads, “pass-ups” and “bunching”

During the early years of this decade, bus ridership declined due primarily to a poor local economy. More recently, ridership is up significantly systemwide. In Seattle, rapid ridership growth has led to overloads on many routes, and increased incidence of “pass-ups”, where a bus rider is left waiting because there is no room for an additional passenger on the bus.

In some cases recurring overloads can be resolved by shifting the assignment of 60' articulated coaches between routes, or by adding a new trip if the overload occurs at a specific time each day. However, in other cases the only way to reduce overloads is to operate more frequent service. Since Metro operates on a fixed budget, which is further restricted by subarea allocation rules, it can be especially difficult to respond to overloads when they occur on Seattle routes.

Overloads and reliability are related. Especially on higher frequency routes, buses can “bunch” together due to slow traffic, delays such as wheelchair or bicycle boarding or uneven passenger arrivals. Essentially, a bus that operates late begins to pick up some of the following trip's load, and the result is to get overloaded and further behind schedule. Meanwhile, the following trip ends up carrying a lighter load, and can operate faster than usual. It is not unusual on routes with high frequencies and heavy ridership for buses to bunch up, and the result is an increase in overloads due to uneven loading between trips.

Special service quality issues in downtown Seattle

Because roughly 60% of Metro Transit bus trips pass through downtown Seattle each day, traffic conditions experienced by buses in downtown Seattle have a huge impact on service quality, affecting overall travel time, reliability, ridership and the cost of service. Traffic in downtown is not the only factor influencing service quality. Other key factors include the number of buses assigned to operate on each street in an hour, the number of buses stopping at each bus stop, the ability of buses to make turns where large volumes of pedestrians cross, passenger crowding at bus stops, traffic queues due to parking, and the availability of layover space for buses between.

The downtown Seattle transit tunnel is the fastest and most reliable path through the downtown area. In the future, buses will share the tunnel with light rail, and the number of buses that will be able to use the tunnel will decrease as light rail frequencies increase until, at some point, only rail will be able to use the tunnel. Third Avenue is the second most reliable path, since it is dedicated to transit throughout peak periods (since 2005). Skip-stop operation on Second and Fourth Avenues provides the third major path for transit in downtown Seattle. Continuous pathways are needed from the point where buses enter the downtown to the end of their service route. Currently buses use a variety of pathways through downtown, making it difficult for riders to know which buses to use to get to other downtown locations.

New development on the fringe of the central business district (CBD)

It takes several minutes to travel by bus through downtown Seattle. When riders are destined to a location at the other end of downtown, the travel time through downtown can be a significant portion of their time on the bus during that trip. As transit speed and reliability through the CBD decreases, riders headed to the far end of downtown face longer trip times.

Since the majority of new CBD development will occur at the edge of downtown; in places like South Lake Union, SODO, and the Denny Triangle; more riders will need to traverse downtown to reach their destination. As the downtown literally expands and as bus travel times downtown increase, it will become even more important to speed buses through the CBD to serve newly-developing areas on the edge of downtown. Since light rail will not serve these emerging markets, speed and reliability investments for buses will be critical to helping transit to attract new downtown residents and employees onto transit.

The Alaskan Way Viaduct, and options to replace it

Metro Transit has worked with WSDOT, the City of Seattle and other transit agencies to plan for replacement of the SR-99 Alaskan Way Viaduct. No matter what solution is adopted, this project poses opportunities but also big challenges for transit. This project is likely to change how transit accesses the Seattle CBD from SR 99 both north and south of downtown. New access provided at the south end of downtown will allow buses from the South to serve the South downtown market more effectively, compared to existing service that enters the CBD at Seneca Street, north of many riders' destinations. The project could also have a huge impact on Metro's operating environment downtown both during construction and once the project is complete.

The Alaskan Way Viaduct carries 110,000 auto trips through the downtown on a daily basis. If the Viaduct is closed for construction or reduced significantly in lane capacity, many of those trips will disappear, but many will shift to I-5 and parallel city streets where most Metro transit service operates, adding congestion to existing bottlenecks at entry points into the CBD. Metro will face twin challenges - maintaining fast and reliable service in the face of greater congestion, and serving increased transit ridership that will be needed to maintain good access into the downtown area. Achieving higher ridership will require critical attention to service quality.

The “Transit Blueprint”

Metro has worked with other transit agencies to develop a “transit blueprint” strategy that would simplify transit route patterns through downtown Seattle and to concentrate service onto the most reliable paths for transit. The blueprint strategy was developed to prepare for the possibility that the Alaskan Way Viaduct could be closed for an extended period during construction, and has gradually become recognized as the best approach to maintain fast, reliable service and improved circulation in downtown Seattle.

Under the blueprint strategy, transit routes will be placed on common paths through the CBD, placing an optimal volume of buses on each path to maximize use of the most reliable pathways - the transit tunnel, Third Avenue, and the Second/Fourth Avenue couplet. Turns from Third Avenue would be minimized to allow riders to use any bus to circulate from one end of downtown to the other with certainty and ease.

Service quality issues for freeway express buses

When Metro Transit was created in 1972, the region had recently rejected two mass transit ballot measures that would have established a subway system connecting Seattle and nearby suburbs. Having been twice defeated, in part due to economic conditions at the time, Metro set out to establish a high-performance bus system and to spread transit service and accessibility beyond the former Seattle Transit system to King County’s suburbs. Early demonstrations of freeway-based transit service called “Blue Streak” were described in planning documents as “bus rapid transit”, introducing express bus service from park and ride lots north of Seattle to the south end of the Seattle CBD using a restricted ramp to the I-5 express lanes at 5th Ave. and Cherry St.

Over the next two decades the freeway express concept was developed and improved. A large supply of park and ride lots was built as part of the interstate highway construction program, and other lots were built using transit funds. The state constructed a network of HOV lanes, and Metro constructed the downtown Seattle transit tunnel. Express service continues to provide regional access to downtown Seattle and the University District, and more strategic access to other activity centers.

More recently, Sound Transit has constructed HOV direct access ramps and additional park and ride lots that serve both the all-day regional express routes and peak-period express routes that are still operated by Metro and other local transit agencies.

HOV lane and freeway performance

HOV lanes offer speed and reliability advantages over general purpose lanes, but this advantage has diminished due to overuse. Currently buses using the freeway system for the majority of their route-miles have the worst on-time performance systemwide. The carpool definition is 2-or-more (2+) passengers in all corridors except for a portion of SR 520 (3+), and with that definition, the volume of cars in many of the region's HOV lanes has increased over time to the point where these lanes now experience congestion and fail to meet the state's HOV performance standard of 45 mph travel during 90% of peak periods. Unless steps are taken to manage traffic volumes in HOV lanes, they will fail to meet their purpose of delivering fast and reliable service for transit and high occupancy vehicles.

Managing lane volumes based only on the number of occupants in a vehicle provides only a very blunt management tool. At a 3+ definition the number of vehicles in an HOV lane is cut by two-thirds, leaving a perception that the lane is underused, while adding a thousand cars per hour to an already-congested general purpose roadway. A more precise management approach would combine a three-person carpool definition with other management tools, such as High Occupancy Tolling lanes (or HOT lanes), which can be adjusted to achieve the desired traffic volumes in those "managed" lanes.

HOV management – permits for 2-person carpools

Tolling and HOT lanes have been discussed previously in the briefing paper on emerging issues. It is possible that tolling policy can also help achieve HOV performance objectives, but a political consensus on a complete tolling system could take several years to achieve. In the interim, WSDOT could implement a peak period 3-person carpool definition in corridors that don't meet speed and reliability standards, and allow 2-person carpools to continue using HOV lanes during peak periods by purchasing a permit and displaying it on their car. A permit system for 2-person carpools would allow HOV lanes to be better managed, while giving 2-person carpools an option to continue to use them.

HOV connections

With HOV lanes on the left-side of the freeway and exit ramps on the right, buses need to weave across general purpose traffic to enter and exit. If congestion makes that difficult, then buses move to the right lane in advance of the congestion to avoid missing their exit, and forego use of the HOV lane. Sound Transit has invested in direct access ramps to address this issue, and to allow buses to make intermediate station stops.

At key locations, it remains difficult to get into and out of HOV lanes. Among these, the most critical is the connection into Seattle from the I-5 HOV lanes to the south. Metro has long championed a direct access connection connecting the I-5 HOV lanes with the SODO busway in the vicinity of Industrial Way S. When congestion is present – which occurs most every day – buses must move to the right lane well before Spokane St., requiring bus passengers from south King County to sit in congested traffic rather than to speed by in the HOV lane.

Metro Transit is an active participant in planning for major freeway corridor improvements to ensure that transit vehicles will have a reliable pathway, including access onto and off of individual freeway HOV lanes. For the SR 520 bridge replacement and HOV lane project, Metro has worked with other agencies to incorporate direct access ramps between SR 520 and the I-5 express lanes, and at the Montlake and 108th Ave NE interchanges. Metro Transit is also active in the development of options to replace the SR 99 Alaskan Way viaduct to ensure reliable transit pathways on SR 99 and into and through downtown Seattle both during and after construction of any replacement option.

Overloads and park-and-ride capacity

Freeway express services have also seen rapid ridership increases, as gas prices have increased and the economy improved. Overloaded buses are more common. The same strategies that are used to address overloads on Seattle routes (shifting 60' articulated buses between routes or adding new trips) are used in this case also. When overloads become recurring and chronic, more frequent service is needed. Ultimately, this results in adding the considerable cost of new coaches to solve the problem.

Transit service quality does not usually address whether riders can find a spot at a park-and-ride lot, but availability of park-and-ride lot stalls is becoming a concern for many riders. As gas prices have increased, many drivers have chosen to try transit for the first time, and park-and-ride lot usage has increased quickly. Availability of park-and-ride capacity is a service quality issue at some lots today. If ridership trends continue on the course seen over the past three years, the number of lots where insufficient parking is available will increase. Local communities face other issues when park and ride spaces do not accommodate the overflow.

Service quality for local suburban service, and throughout the system

Suburban local services face some of the same issues as Seattle service, but the issues are more related to traffic congestion and ridership increases, rather than the route design and structural issues that slow transit in Seattle such as short stop spacing and long routes. Traffic congestion steadily worsens in suburban areas as new development occurs, just as it does everywhere in the county in places where land use is becoming rapidly more intense or near freeway access points.

Aside from strategies to address route design issues discussed earlier in this paper, the key strategies used to manage service quality are similar for routes throughout the Metro system. These include:

- **Schedule adjustments:** As travel times change, Metro adjusts its schedules to make sure each trip operates on time and can begin its next trip on time. When travel times vary due to congestion, more time is needed for layover so that the bus can start its next trip on schedule even when its previous trip ran late. These types of scheduling adjustments are part of what has been referred to as “schedule maintenance.”

- **Managing fleet assignments:** Sometimes it is possible to swap 40' with 60' buses to accommodate larger loads on higher ridership routes. This assumes that there are either 60' coaches that are not being used, or that routes using 60' buses today will not become overloaded if a 40' bus is assigned tomorrow.
- **Supervision:** Metro monitors bus driver performance to ensure that bus drivers leave their terminal on schedule and that they are not early at timepoints. In addition, supervisors attempt to respond to anything which may cause a service delay (accidents, fires, construction, etc.).
- **Speed and reliability improvements:** Metro works closely with local jurisdictions and the State DOT to manage traffic systems that can give transit additional priority in traffic. Improvements can include changes to signal operation, signal priority measures, continuous transit lanes, transit-only turn movements, and "queue-jumps" at intersections for example.
- **Construction coordination:** Metro works with other agencies and property developers to minimize or mitigate the impacts of major construction projects on transit service and fixed facilities such as shelters and overhead trolley-bus power lines. By planning construction-related changes in advance and communicating them effectively to passengers, many of the negative impacts on passengers can be reduced or eliminated.
- **Real-time service control measures:** Radio dispatchers and service supervisors in the field manage service during special events and respond to incidents to minimize disruption to service and return service to its schedule. Transit police intervene to address criminal activity that may also disrupt service. The level of security perceived by customers is also a form of service quality.

Measures That Can Improve Service Quality

Several of the strategies in the existing strategic plan address service quality. This section addresses some of these strategies, and other approaches that could help improve service quality.

A key issue is how service quality will be monitored, and how monitoring information will be used to trigger improvements to service. This issue is the subject of an upcoming briefing paper on guidelines and monitoring that will be presented to RTC at the May meeting and discussed at the June meeting. Guidelines and measures may be helpful if they provide the information that will help suggest the preferred response to address service quality problems.

Existing strategies to maintain or improve service quality

In the existing Strategic Plan, strategies related to service quality include:

- **Service Design:** Calls for planners to develop routes that can be operated reliably, and for schedulers to adjust schedules to make them better match actual running times and to leave enough time between trips to allow each trip to begin on time. This strategy sets aside a portion of service hours for that purpose, and to add trips when overloads occur.

- **Speed and Reliability:** This capital investment strategy directs Metro to work with local jurisdictions to invest in physical improvements that move transit more quickly through traffic. Metro has a work unit that provides funding and technical support to help jurisdictions provide transit priority measures.
- **Partnerships:** One of the new elements of *Transit Now* is a speed and reliability partnership program. Service hour incentives are provided to jurisdictions which enter agreement that commit to street operation improvements to reduce transit travel times significantly and sustainably.
- **Terminals and Layover:** A new strategy was added to the strategic plan in its 2007 update that calls out the need to locate layover space where needed at route termini. When layover is poorly located, it can increase operating cost and contribute to declining service quality.

RapidRide

The RapidRide program will upgrade bus transit service in five corridors to be similar to a rapid transit experience. While some of these improvements are related to improved buses, facilities and identity, some of the most important improvements will be related to service quality. For each corridor, a variety of service quality strategies will be applied to produce a service that is faster, more reliable, and designed to meet increasing passenger loads. Additionally, some innovative ideas will be tested during the development period. It's reasonable to project that improvements to service quality developed for the RapidRide program would eventually be applied more broadly to other routes. Some of the more significant RapidRide investments to improve service quality being considered include:

- Breaking / changing existing through-routes
- Proof-of-payment fare collection
- Wider stop spacing.
- Aggressive speed and reliability treatments
- Active service management.
- Improved frequency and capacity
- Real-time bus arrival signs

Other strategies that may be effective

The strategic plan does not address every action Metro takes to manage service. Some needed improvements - like HOV lane management - are controlled by other agencies. Additionally, there may be other strategies that could improve service quality in the future. Some other strategies that could improve service quality include:

- **Monitoring and triage:** Key to managing service quality is monitoring the service to identify the cause and most effective response to declining service quality. This will be addressed further in the forthcoming briefing paper on guidelines and monitoring issues.

- **Route lengths and through-routes:** Metro could conduct a thorough assessment of the performance of through-routes and very long routes to determine whether different through-route pairs would be more effective, or whether existing long routes should be broken into two or more separate routes. This analysis would provide valuable information for an assessment of terminal and layover requirements.
- **Stop Spacing:** Metro could conduct a comprehensive examination of older, city routes to create more uniform stop spacing in the system.
- **Headway management vs. scheduled service:** On high-frequency routes where riders are less likely to consult a schedule, it may be more important to manage the spacing between buses rather than the schedule of individual buses. This reduces the effective waiting time for passengers and makes better use of capacity by providing for more even loading. Managing headways instead of schedules would have implications for many of Metro's systems and work groups.
- **Active service management:** More active service supervision measures could be used to address recurring bunching. Examples include holding buses at a control point, turning buses around before they reach their terminal, or running buses in express mode (without stopping to pick up passengers) when buses are bunched together. This strategy requires a larger staff commitment to service supervision, and development of procedures appropriate for each route.
- **Technology:** With the advent of the on-board systems project, a computer and global positioning device on each bus will track the location of the bus along its route. In the future it's possible that this information could also be used to provide smarter approaches to managing signal priority, and to give information to the bus driver to help control his or her schedule. If each bus also had information about the location of its leader and follower, it could be possible to use smart signal control and driver guidance to help drivers maintain even headway spacing.
- **Blueprint:** As discussed above, with roughly two-thirds of Metro service trips passing through downtown Seattle, a key element of service quality must involve securing reliable paths through downtown Seattle, and concentrating service on the paths that are the fastest and most reliable.

Strategic Plan Issues

Following are issues that could be considered in the update to the strategic plan:

How should Metro monitor service quality and identify the best remedy for problems?

This issue will be addressed in the upcoming briefing paper on guidelines and measures.

How should route design problems be addressed?

How should resources be balanced between fixing structural service quality issues on these routes as opposed to adding new service? A new strategy is proposed to reconsider existing through-routes and terminal requirements comprehensively. A revision to the service design strategy proposes to systematically review stop spacing on existing routes.

What can be done to improve speeds and reliability for freeway HOV lanes?

The promise of the HOV system to provide a reliable right-of-way for transit relies on managing them to keep them from becoming as congested as general purpose lanes. A new policy is proposed calling for the State DOT to manage HOV lane volumes actively.

How can schedules be maintained to reflect increasing travel times?

If travel times change on a route, but the schedule is not adjusted to match, buses will not be able to achieve reliable on-time performance. Often, buses arriving late at the end of the line will begin their next trip late, and/or the driver is unable to take a scheduled rest break. Layover between trips is the fundamental tool for service control, because it isolates service problems between bus trips allowing each trip to begin on time. Funding schedule maintenance hours is critically important for this purpose; but when the growth of transit revenue limited system growth in the early part of this decade these Schedule Maintenance adjustments were dramatically reduced. A new policy is proposed to clarify the importance of balancing service quality with new service expansion. Revisions are proposed to the service design strategy to allow more flexible and effective use of schedule maintenance resources.

How can buses traverse downtown Seattle effectively and serve an expanding CBD?

Downtown Seattle presents special challenges for transit, and operations in downtown affect service quality throughout the Metro system. In addition, rapid growth in locations around the perimeter of downtown requires more riders to traverse downtown streets to reach destinations at the other end of the CBD. A new strategy is proposed to develop priority pathways through downtown Seattle and to concentrate service onto the fastest and most reliable paths.

How can Metro develop and test innovative approaches to improving service quality?

There are many approaches that could be tried to improve service quality that would require significant cost and risk to implement systemwide. To foster continuous improvement to Metro's service delivery, a new strategy is proposed to set aside funds for demonstration projects to test, evaluate and deploy promising service delivery innovations.

Possible Changes to Policies and Strategies

PLEASE NOTE:

The following potential changes to policies and strategies are intended to promote discussion about how the strategic and comprehensive plans could respond to issues raised in this briefing paper. They are not a formal policy proposals, but feedback received will help shape the Executive's proposed amendments.

In the following text, **bold and blue** denotes proposed additions, and *red and italic* denotes proposed deletions.

- **Add new policy to put investments in service quality on an equal par with new service.** This would elevate a portion of the existing service design strategy to policy status, and add an increased emphasis on investments in service quality. It would provide a basis for directing a greater share of planning and implementation to maintaining accurate schedules and fixing route design problems on existing routes.

Policy XX: Balance investments in service quality and service expansion

In developing future service improvements, it is equally important to ensure that existing service is fast and reliable as it is to add new service. Strive to maintain or improve the speed and reliability of service through efficient service design and cost-effective investments in improving service quality.

- **Revise the Service Design strategy to be more flexible and effective.** This strategy clarifies that route design to improve service quality should be broadly applied to both existing and new services. The strategy also addresses how to provide adequate resources to adjust schedules to match operating conditions. New flexibility to allow varying levels of schedule adjustments year to year, without reducing the total amount spent over a five year period, will allow schedulers to catch up to deferred schedule adjustment needs when funding becomes available.

Design new service to promote reliability by optimizing route length and stop spacing. Improve transit on-time performance **on existing routes** through: adjustments in routing, splitting **or shortening** of **long routes and** unreliable through-route pairs, adding *of* recovery time between trips, **consolidating bus stops**, moving routes between operating bases, and adding time or trips to schedules to account for slower travel speeds or recurring overloads.

Adjust schedules and add trips as needed to maintain reliable service, reflecting the increased cost of service when traffic conditions deteriorate and overcrowding occurs. Reserve a portion of service hours for this purpose. Schedule *maintenance adjustment* hours shall be reserved in amounts *equal up* to one-third of new service investments **in any five-year period** and up to 0.5% of total annual service hours **in any given year** *with the remaining two-thirds of new service hours allocated according to Strategy IM-3.* The schedule *maintenance adjustment* hours allocation shall be achieved

in accordance with the timetable established in Strategy IM-3 without regard to subareas. Schedule maintenance hours that are not used for schedule maintenance in each year shall be used for new service.

In the event that **If** schedule maintenance hours are proposed at a level exceeding 0.5% of total annual service hours by the Department of Transportation, the Regional Transit Committee **may recommend an exemption of this policy on a year-to-year basis to the King County Council.** *shall review this proposal and recommend any change in allocation policy to the Metropolitan King County Council.* **In cases where there is no exemption,** schedule maintenance requirements exceeding the service hours available under this policy will be funded by a reduction of existing services within the same subarea.

If schedule maintenance requirements, as assessed by established measures and guidelines, exceed hours available under this policy for a period of more than three years, a review of the policy should be conducted to assess an appropriate level of schedule maintenance investment.

- **Set aside funds for projects to demonstrate innovative approaches to service delivery and customer information.** By setting aside funds to demonstrate innovative ideas, Metro will foster continuous improvement of service delivery and customer service by testing ideas that could have broad application if shown to be successful. Metro could promote innovation in service marketing and delivery by using grant or short-term expenditures to develop and demonstrate ideas and practices with potential to improve service reliability, effectiveness or efficiency, or that make transit service easier to understand and use. This could be developed as part of a broader strategy on demonstration projects. (Also discussed in marketing paper).
- **Modify speed and reliability strategy to promote active management of freeway HOV lanes.** Metro relies on the State DOT to manage HOV lanes. Increasing portions of the state HOV system are failing to meet adopted HOV speed and reliability standards, which has degraded transit speed and reliability in several freeway corridors. A permit system that would require 2-person carpools to purchase a permit to use HOV lanes during peak periods would allow WSDOT to reduce volumes in HOV lanes without dramatic impacts on other traffic.

Strategy C-3: Speed, Reliability and Safety

Partner with state and local governments to improve transit operating efficiency, and to create speed, safety, and reliability improvements on important transit corridors. In cooperation with local jurisdictions, focus on the target corridors identified in Exhibit 5-2.

Advocate for active management of the state HOV system to achieve adopted speed and reliability standards. In the near-term, promote a three-person peak period carpool definition, while allowing two-person carpools to continue use by purchasing a permit.

- **Add a new strategy to develop priority pathways through the Seattle CBD and to optimize use of the fastest and most reliable paths.** This strategy adds the Transit Blueprint to the strategic plan. The transit blueprint was developed to help mitigate the impacts of constructing a replacement for the Alaskan Way Viaduct, but the rationale it proposes makes common sense regardless of what solution is selected for Seattle's waterfront.

Strategy XX: Priority Transit Pathways through the Seattle CBD

Develop and maintain a “transit blueprint” designating priority pathways through downtown Seattle. Concentrate transit services onto the fastest and most reliable pathways. Work collaboratively with Seattle, WSDOT, and other transit agencies to manage bus volumes and ensure that these paths will remain reliable along continuous paths that include portals into downtown from SR 99, I-5 and I-90.